SEQUENCE LISTING

<110> Emil D. Kakkis
Becky Tanamachi

<120> Recombinant Alpha-L-Iduronidase, Methods for Producing and Purifying the Same and Methods for Treating Diseases Caused by Deficiencies Thereof

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Leu Ala Ala Pro Pro Val Ala Pro Ala Glu Ala Pro His Leu Val His
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gtg gac gcg gcc cgc gcg ctg tgg ccc ctg cgg cgc ttc tgg agg agc     1704
Val Asp Ala Ala Arg Ala Leu Trp Pro Leu Arg Arg Phe Trp Arg Ser
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aca ggc ttc tgc ccc ccg ctg cca cac agc cag gct gac cag tac gtc     1752
Thr Gly Phe Cys Pro Pro Leu Pro His Ser Gln Ala Asp Gln Tyr Val
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ctc agc tgg gac cag cag ctc aac ctc gcc tat gtg ggc gcc gtc cct     1800
Leu Ser Trp Asp Gln Gln Leu Asn Leu Ala Tyr Val Gly Ala Val Pro
                70                  75                  80

cac cgc ggc atc aag cag gtc cgg acc cac tgg ctg ctg gag ctt gtc     1848
His Arg Gly Ile Lys Gln Val Arg Thr His Trp Leu Leu Glu Leu Val
            85                  90                  95

acc acc agg ggg tcc act gga cgg ggc ctg agc tac aac ttc acc cac     1896
Thr Thr Arg Gly Ser Thr Gly Arg Gly Leu Ser Tyr Asn Phe Thr His
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ctg gac ggg tac ctg gac ctt ctc agg gag aac cag ctc ctc cca ggg     1944
Leu Asp Gly Tyr Leu Asp Leu Leu Arg Glu Asn Gln Leu Leu Pro Gly
    115                 120                 125

ttt gag ctg atg ggc agc gcc tcg ggc cac ttc act gac ttt gag gac     1992
Phe Glu Leu Met Gly Ser Ala Ser Gly His Phe Thr Asp Phe Glu Asp
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aag cag cag gtg ttt gag tgg aag gac ttg gtc tcc agc ctg gcc agg     2040
Lys Gln Gln Val Phe Glu Trp Lys Asp Leu Val Ser Ser Leu Ala Arg
                150                 155                 160

aga tac atc ggt agg tac gga ctg gcg cat gtt tcc aag tgg aac ttc     2088
Arg Tyr Ile Gly Arg Tyr Gly Leu Ala His Val Ser Lys Trp Asn Phe
            165                 170                 175

gag acg tgg aat gag cca gac cac cac gac ttt gac aac gtc tcc atg     2136
Glu Thr Trp Asn Glu Pro Asp His His Asp Phe Asp Asn Val Ser Met
        180                 185                 190

acc atg caa ggc ttc ctg aac tac tac gat gcc tgc tcg gag ggt ctg     2184
Thr Met Gln Gly Phe Leu Asn Tyr Tyr Asp Ala Cys Ser Glu Gly Leu
    195                 200                 205

cgc gcc gcc agc ccc gcc ctg cgg ctg gga ggc ccc ggc gac tcc ttc     2232
Arg Ala Ala Ser Pro Ala Leu Arg Leu Gly Gly Pro Gly Asp Ser Phe
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cac agg cca ccg cga tcc ccg ctg agc tgg ggc ctc ctg cgc cac tgc     2280
His Arg Pro Pro Arg Ser Pro Leu Ser Trp Gly Leu Leu Arg His Cys
                230                 235                 240

cac gac ggt acc aac ttc ttc act ggg gag gcg ggc gtg cgg ctg gac     2328
His Asp Gly Thr Asn Phe Phe Thr Gly Glu Ala Gly Val Arg Leu Asp
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a' cont

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        260                 265                 270

gag cag gag aag gtc gtc gcg cag cag atc cgg cag ctc ttc ccc aag      2424
Glu Gln Glu Lys Val Val Ala Gln Gln Ile Arg Gln Leu Phe Pro Lys
    275                 280                 285

ttc gcg gac acc ccc att tac aac gac gag gcg gac ccg ctg gtg ggc      2472
Phe Ala Asp Thr Pro Ile Tyr Asn Asp Glu Ala Asp Pro Leu Val Gly
290                 295                 300                 305

tgg tcc ctg cca cag ccg tgg agg gcg gac gtg acc tac gcg gcc atg      2520
Trp Ser Leu Pro Gln Pro Trp Arg Ala Asp Val Thr Tyr Ala Ala Met
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gtg gtg aag gtc atc gcg cag cat cag aac ctg cta ctg gcc aac acc      2568
Val Val Lys Val Ile Ala Gln His Gln Asn Leu Leu Leu Ala Asn Thr
            325                 330                 335

acc tcc gcc ttc ccc tac gcg ctc ctg agc aac gac aat gcc ttc ctg      2616
Thr Ser Ala Phe Pro Tyr Ala Leu Leu Ser Asn Asp Asn Ala Phe Leu
        340                 345                 350

agc tac cac ccg cac ccc ttc gcg cag cgc acg ctc acc gcg cgc ttc      2664
Ser Tyr His Pro His Pro Phe Ala Gln Arg Thr Leu Thr Ala Arg Phe
    355                 360                 365

cag gtc aac aac acc cgc ccg ccg cac gtg cag ctg ttg cgc aag ccg      2712
Gln Val Asn Asn Thr Arg Pro Pro His Val Gln Leu Leu Arg Lys Pro
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gtg ctc acg gcc atg ggg ctg ctg gcg ctg ctg gat gag gag cag ctc      2760
Val Leu Thr Ala Met Gly Leu Leu Ala Leu Leu Asp Glu Glu Gln Leu
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tgg gcc gaa gtg tcg cag gcc ggg acc gtc ctg gac agc aac cac acg      2808
Trp Ala Glu Val Ser Gln Ala Gly Thr Val Leu Asp Ser Asn His Thr
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gtg ggc gtc ctg gcc agc gcc cac cgc ccc cag ggc ccg gcc gac gcc      2856
Val Gly Val Leu Ala Ser Ala His Arg Pro Gln Gly Pro Ala Asp Ala
        420                 425                 430

tgg cgc gcc gcg gtg ctg atc tac gcg agc gac gac acc cgc gcc cac      2904
Trp Arg Ala Ala Val Leu Ile Tyr Ala Ser Asp Asp Thr Arg Ala His
    435                 440                 445

ccc aac cgc agc gtc gcg gtg acc ctg cgg ctg cgc ggg gtg ccc ccc      2952
Pro Asn Arg Ser Val Ala Val Thr Leu Arg Leu Arg Gly Val Pro Pro
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ggc ccg ggc ctg gtc tac gtc acg cgc tac ctg gac aac ggg ctc tgc      3000
Gly Pro Gly Leu Val Tyr Val Thr Arg Tyr Leu Asp Asn Gly Leu Cys
                470                 475                 480

agc ccc gac ggc gag tgg cgg cgc ctg ggc cgg ccc gtc ttc ccc acg      3048
Ser Pro Asp Gly Glu Trp Arg Arg Leu Gly Arg Pro Val Phe Pro Thr
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a' cont

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Ala Pro Arg Pro Leu Pro Ala Gly Gly Arg Leu Thr Leu Arg Pro Ala
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ctg cgg ctg ccg tcg ctt ttg ctg gtg cac gtg tgt gcg cgc ccc gag      3192
Leu Arg Leu Pro Ser Leu Leu Leu Val His Val Cys Ala Arg Pro Glu
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aag ccg ccc ggg cag gtc acg cgg ctc cgc gcc ctg ccc ctg acc caa      3240
Lys Pro Pro Gly Gln Val Thr Arg Leu Arg Ala Leu Pro Leu Thr Gln
                550                 555                 560

ggg cag ctg gtt ctg gtc tgg tcg gat gaa cac gtg ggc tcc aag tgc      3288
Gly Gln Leu Val Leu Val Trp Ser Asp Glu His Val Gly Ser Lys Cys
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ctg tgg aca tac gag atc cag ttc tct cag gac ggt aag gcg tac acc      3336
Leu Trp Thr Tyr Glu Ile Gln Phe Ser Gln Asp Gly Lys Ala Tyr Thr
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ccg gtc agc agg aag cca tcg acc ttc aac ctc ttt gtg ttc agc cca      3384
Pro Val Ser Arg Lys Pro Ser Thr Phe Asn Leu Phe Val Phe Ser Pro
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gac aca ggt gct gtc tct ggc tcc tac cga gtt cga gcc ctg gac tac      3432
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tgg gcc cga cca ggc ccc ttc tcg gac cct gtg ccg tac ctg gag gtc      3480
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Pro Val Pro Arg Gly Pro Pro Ser Pro Gly Asn Pro
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a' cont

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20 25 30
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35 40 45
Ser Thr Gly Phe Cys Pro Pro Leu Pro His Ser Gln Ala Asp Gln Tyr
50 55 60
Val Leu Ser Trp Asp Gln Gln Leu Asn Leu Ala Tyr Val Gly Ala Val
65 70 75 80
Pro His Arg Gly Ile Lys Gln Val Arg Thr His Trp Leu Leu Glu Leu
85 90 95
Val Thr Thr Arg Gly Ser Thr Gly Arg Gly Leu Ser Tyr Asn Phe Thr
100 105 110
His Leu Asp Gly Tyr Leu Asp Leu Leu Arg Glu Asn Gln Leu Leu Pro
115 120 125
Gly Phe Glu Leu Met Gly Ser Ala Ser Gly His Phe Thr Asp Phe Glu
130 135 140
Asp Lys Gln Gln Val Phe Glu Trp Lys Asp Leu Val Ser Ser Leu Ala
145 150 155 160
Arg Arg Tyr Ile Gly Arg Tyr Gly Leu Ala His Val Ser Lys Trp Asn
165 170 175
Phe Glu Thr Trp Asn Glu Pro Asp His His Asp Phe Asp Asn Val Ser
180 185 190
Met Thr Met Gln Gly Phe Leu Asn Tyr Tyr Asp Ala Cys Ser Glu Gly
195 200 205
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210 215 220
Phe His Arg Pro Pro Arg Ser Pro Leu Ser Trp Gly Leu Leu Arg His
225 230 235 240

a' cont.

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            260                 265                 270
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        275                 280                 285
Lys Phe Ala Asp Thr Pro Ile Tyr Asn Asp Glu Ala Asp Pro Leu Val
    290                 295                 300
Gly Trp Ser Leu Pro Gln Pro Trp Arg Ala Asp Val Thr Tyr Ala Ala
305                 310                 315                 320
Met Val Val Lys Val Ile Ala Gln His Gln Asn Leu Leu Leu Ala Asn
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Thr Thr Ser Ala Phe Pro Tyr Ala Leu Leu Ser Asn Asp Asn Ala Phe
            340                 345                 350
Leu Ser Tyr His Pro His Pro Phe Ala Gln Arg Thr Leu Thr Ala Arg
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Phe Gln Val Asn Asn Thr Arg Pro Pro His Val Gln Leu Leu Arg Lys
    370                 375                 380
Pro Val Leu Thr Ala Met Gly Leu Leu Ala Leu Leu Asp Glu Glu Gln
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Leu Trp Ala Glu Val Ser Gln Ala Gly Thr Val Leu Asp Ser Asn His
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Thr Val Gly Val Leu Ala Ser Ala His Arg Pro Gln Gly Pro Ala Asp
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Ala Trp Arg Ala Ala Val Leu Ile Tyr Ala Ser Asp Asp Thr Arg Ala
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His Pro Asn Arg Ser Val Ala Val Thr Leu Arg Leu Arg Gly Val Pro
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Pro Gly Pro Gly Leu Val Tyr Val Thr Arg Tyr Leu Asp Asn Gly Leu
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Cys Ser Pro Asp Gly Glu Trp Arg Arg Leu Gly Arg Pro Val Phe Pro
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Gln Gly Gln Leu Val Leu Val Trp Ser Asp Glu His Val Gly Ser Lys
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a1 cont